

Condensed matter physics-theory group

The condensed matter theory group investigates several areas in condensed matter. The main method used in our research is the Many-Body Theory. Other complementary research methods are the Renormalization Group Theory, and several (simple) numerical methods. The research is focused on low dimensional systems (quantum dots, two dimensional systems (graphene), quantum wires), with the aim to determine their physical properties in various conditions. The physical properties of low dimensional systems differ drastically from the physical properties of bulk systems. The main research area, at the present time, is focused on graphene systems. This material, synthesized about a decade ago has unusual properties due to the Dirac-like band structure, and due to the quasiparticle excitations dispersion. We study these materials in the presence of disorder, an energy gap, and external fields. During our research we collaborate with similar research groups from Spain, Korea, and US.